

From: Granger, Michelle
To: Oconnell, Kimberly
Subject: FW: Pohatcong OU3 Response-To-Comment backcheck for Draft RDWP
Date: Thursday, January 25, 2018 9:22:54 AM
Attachments: [RTC Draft RDWP+QAPP \(Rev 9\) FINAL USACE back check.docx](#)
[RTC Draft RDWP+QAPP \(Rev 9\) FINAL USACE back check.pdf](#)

Hi, Kim-

In the attached response to comments Erin highlighted comments that need additional attention from EPA. Can we discuss some of highlighted comments today? I'd like to email Bruce later today with a few items we'd like to discuss next week at the site tour.

Do you want to talk after you look at the attached highlighted comments? Let me know when is a good time to call you.

Also, Bruce says he has hard hats and good maps we can use at the site trailer.

Thank you!
Michelle-

From: Granger, Michelle
Sent: Wednesday, January 24, 2018 4:20 PM
To: Granger, Michelle
Subject: FW: Pohatcong OU3 Response-To-Comment backcheck for Draft RDWP

From: Hauber, Erin M CIV USARMY CENWK (US) [<mailto:Erin.M.Hauber@usace.army.mil>]
Sent: Friday, December 29, 2017 12:21 PM
To: Granger, Michelle <Granger.Michelle@epa.gov>
Cc: Watts, Joshua A CIV USARMY CENWK (US) <Joshua.A.Watts@usace.army.mil>; Brink, Bradley J CIV USARMY CENWK (US) <Bradley.J.Brink@usace.army.mil>; L'Ecuier, Jason R CIV USARMY CENWK (US) <Jason.R.LEcuier@usace.army.mil>; Darpinian, Amy S CIV USARMY CENWK (US) <Amy.F.Darpinian@usace.army.mil>; Bonney, Conrad H CIV USARMY CENWK (US) <Conrad.H.Bonney@usace.army.mil>
Subject: Pohatcong OU3 Response-To-Comment backcheck for Draft RDWP

Hi Michelle,

We completed our review of the RTCs associated with RDWP and QAPP and included items of note below. I also had in my notes to revisit USACE oversight needs during PDI which is scheduled to run from 2/21-7/3. We also have availability on T,W,F of next week for a call if needed.

USACE RDWP Comments:

- See attached back check table
- Comments that are highlighted require additional attention from EPA
- o The EVS model was updated and resulted in a doubling of the estimated volume of soil > 1 mg/kg. We should

clarify what changed.

- o Proposed criteria to support SVE-only vs. thermal remedy (USACE believes SVE-only criteria are likely to be met)
- o Verification sampling (non-committal) on confirmation soil sampling for SVE only remedy)
- o Proposed installation of two new monitoring wells outside source area: POHMW48 and 49.

USACE QAPP Back check:

Follow-up items:

- o Several tables listed in the QAPP table of contents and cited in the document were not included in the electronic file (example: Table 2A). Request that the PRP submit a complete document.
- o Per the last QAPP comment, the PRP will be submitting a QAPP Addendum with the updated Cascade Mobile Lab SOPs. Our chemist would like to review once available.
- o The CD-ROM provided with the document has the QAPP Appendices. USACE chemist would like to review when available.

Happy New Year!

Erin

Erin Hauber, P.E.

Civil Engineer

Kansas City District

US Army Corps of Engineers

816.389.2280

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USEPA Comment	Response	USACE Back check (Dec 28, 2017)
General Comment		
<p>1. Conceptual Site Model - The lateral extent of TCE > 1 mg/kg is so much greater from 60 to 100 ft bgs compared to 0 to 60 ft. If TCE originated from leaky drain/sewer lines, migrated vertically due to density driven and/or hydraulic head and began spreading laterally from the 60-100 ft interval, is this a result of changes in vertical and/or horizontal permeability/soil architecture in this zone, greater sorption on the soil matrix in this interval, other reasons? Please include an updated discussion of the CSM within the Pilot/Treatability Study Evaluation Report. Also, please add P/TSE Report to the acronym list.</p>	<p>Per USEPA's request, an updated discussion of the CSM will be provided within the forthcoming Pilot/Treatability Study Evaluation Report. Based on information contained in the May 2016 Final Remedial Investigation Report and June 2016 Final Feasibility Study Report, a discussion of the CSM has also been included in Section 2.5 of the revised Draft RDWP. Pilot/Treatability Study Evaluation (P/TSE) has also been added to the acronym list of the RDWP and the SVE Pilot Test Work Plan.</p>	<p>Concur.</p> <p>Note to EPA: Additional text added to Section 2.5 indicates Ramboll-Environ's hypothesis that soil architecture / change in permeability is responsible for higher lateral distribution from 60-100 ft. Response to Figure Comment #1 indicates upward fining/downward coarsening may explain greater extent mass at depth. The P/TSE will include an updated CSM based on additional borings. Also, model assumptions appear to have adjusted estimated extent of TCE (EVS volume of soil >1 mg/kg TCE went from 6,800 cubic yards to 13,110 cubic yards). See image at end of table comparing RDWP figures.</p>
Specific Comments		
<i>Section 1. Introduction</i>		

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<p>1. Section 1.1, Purpose and Scope of RDWP - Ensure future design submittals consider other elements of the OU3 remedy, such as the long term operation of the SSD and long-term GW and indoor air monitoring to assess remedy effectiveness. Include a section, beginning with the 30% Design Report, that discusses whether the current SSD will be modified during the RA (based on PDI results and decision to implement thermal) and how indoor air and impact to groundwater will be evaluated to assess remedy performance.</p> <p>Also, for the SSD operations to date, provide a time series chart for TCE removal.</p>	<p>The following text has been added to Section 1.1 of the revised Draft RDWP: <i>"Future design submittals, beginning with the 30% Design Report, will include a section that discusses whether the current SSD will be modified during the RA (based on the PDI results and decision to implement thermal) and the methodology that will be used to evaluate indoor air and groundwater quality to assess remedy performance."</i></p> <p>A graph of the cumulative mass of TCE removed by the SVE/SSD system from the period of July 2013 through October 2017 has been added as Figure 4 in the revised Draft</p>	<p>Concur.</p> <p>Note to EPA:</p> <p>Proposed text and figure added.</p> <p>Figure 4 – subslab TCE removal rates are not declining (~0.4 lbs/day over last 2 yrs) and appear indicative of a continuing source.</p>
<p>2. Section 1.1, Purpose and Scope of RDWP, 4 bullets - Please replace the 4 bullets in the draft RDWP to match the following 4 bullets from the OU3 ROD:</p> <p>The major components of the selected remedy for OU3 include:</p> <ul style="list-style-type: none"> • The implementation of deep SVE and/or thermal treatment to address deep soil contamination underlying the former American National Can (ANC) building; • Long-term operation and maintenance of the existing shallow SVE and SSD systems within the former ANC building; • Long-term groundwater and indoor air monitoring in the OU3 Study Area will be performed over time to assess the remedy's effectiveness; and • Institutional controls, including the existing deed notice, will remain in effect at the former ANC property and will be amended to reflect the components of the Selected Remedy for OU3 that will be implemented at the former ANC property. The institutional controls periodically will be verified as remaining in effect as part of the long-term monitoring effort. 	<p>The text in Section 1.1 of the revised Draft RDWP has been revised to match the major components of the selected remedy as stated on the OU3 ROD.</p>	<p>Concur.</p> <p>Note to EPA:</p> <p>Text added as indicated.</p>

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3. Section 1.1, Purpose and Scope of RDWP, Paragraph 2, last sentence - Please change the sentence to, "Unanticipated changes to the RD approach or processes described in the RDWP or identified during its implementation will be communicated with USEPA prior to any changes being made."	The following text has been added to Section 1.1 of the revised Draft RDWP: <i>"Unanticipated changes to the RD approach or processes described in this RDWP or identified during its implementation will be communicated with USEPA prior to any changes being made."</i>	Concur. Note to EPA: Text added as indicated.
4. Section 1.2.1 Progress Updates - A monthly written report is needed as well as per the CD. Please add a sentence to this effect in this paragraph. Also, please include the SSD data in the monthly written reports.	The submittal of Monthly Progress Reports (MPRs) pursuant to Section X (REPORTING REQUIREMENTS), paragraph 30 of the CD has been added to the text of Section 1.2.1 of the revised Draft RDWP. Please note, however, that since the date of entry of the CD these MPRs that include a summary of the SVE/SSDS operational data have been and will continue to be submitted to the Agency in accordance with	Concur. Note to EPA: Text added as indicated.
<i>Section 2. Background</i>		
1. Section 2.1, Site Description, first sentence – Change "10 miles" to "8.5 miles".	The requested change has been incorporated to the text of Section 2.1 in the revised Draft RDWP.	Concur. Note to EPA: Text added as indicated.
2. Section 2.1, Site Description. second paragraph - Please mention the groundwater treatment plant as a feature of the site in this paragraph.	The following text has been added to the end of the second paragraph in Section 2.1 of the revised Draft RDWP: <i>"The GWETS treatment equipment is housed in a pre-engineered treatment building (50-foot by 50-foot by 25-foot high), which is located on the southwestern portion of the property."</i>	Concur. Note to EPA: Text added as indicated.
3. Section 2.5 – (EVS Model) – A few questions: 1) Can a copy of the 3D EVS model be provided as a 4dim viewer file? 2) Can the proposed boring locations be presented within this viewer if currently in the model? 3) Has the top of the weathered and/or carbonate bedrock been input into the model, similar to the version shown in Figure 1-9 from the FS?	1.) A copy of the 3D EVS model as a 4dim viewer file is provided on the enclosed CD-ROM. 2.) The proposed boring locations are presented within the viewer. 3.) The top of the weathered and/or carbonate bedrock has been input into the EVS model and is included in the 4dim viewer file provided on the enclosed CD-ROM.	Note to EPA: USACE reviewed the 4Dim model. Changing "Current State" to 1, 2, 3, and 4 allows toggling of different layers: bedrock surface, proposed borings and samples, aerial/topo, and existing borings.

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4. Section 2.5, Summary of the OU3 (Source Area A) Soil TCE Impacts, second paragraph, first sentence and last sentence - Replace "CDM Smith" with "EPA".	As requested, the text in Section 2.5 has been revised in the revised Draft RDWP.	Concur. Note to EPA: Text added as indicated.
5. Section 2.5, Summary of the OU3 (Source Area A) Soil TCE Impacts, third paragraph, first sentence - Replace "CDM Smith" with "EPA".	As requested, the text in Section 2.5 has been revised in the revised Draft RDWP.	Concur. Note to EPA: Text added as indicated.
6. Section 2.6, Soil Physical Characteristics, first sentence and last sentence - Replace "CDM Smith" with "EPA".	As requested, the text in Section 2.6 has been revised in the revised Draft RDWP.	Concur. Note to EPA: Text added as indicated.
7. Section 2.8 – Summary of Selected Remedy, first paragraph - "...However, treatment of shallower soil impacts in the 5 to 30-foot depth range may be necessary based on the results from the PDI activities." Please present the basis for the extent of treatment, including the 5 to 30-ft interval, in the P/TSE Report.	Future design submittals, including the P/TSE Report and the 30% Preliminary Design Report, will present the basis for the extent of treatment by including an evaluation of the extent of unsaturated soil impacts that are greater than the 1 mg/kg TCE Remedial Goal (RG), including the 5 to 30-ft depth interval.	Concur.
<i>Section 3. Pre-Design Investigation Activities</i>		

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<p>1. Section 3.0, Pre-Design Investigation Activities, third paragraph - "The objective of the SVE pilot test will be to gather data that are necessary for designing a deep SVE system to remediate unsaturated soil identified in OU3 (Source Area A), and assess if implementation of ISTR or deep SVE or a combination of both technologies will be proposed to achieve the OU3 RG of 1 mg/kg TCE in soils."</p> <p>Specify the criteria that will be used to determine whether SVE or thermal will be applied to a given depth or volume where TCE > 1 mg/kg. Design of the PDI is not clear. The PDI has to be designed to make a determination as to whether SVE alone will meet the OU3 RG. Please indicate the objectives of the PDI and what data will be collected to demonstrate that SVE alone will meet the OU3 RG. The likelihood of achieving 1 mg/kg via SVE must be incorporated into this discussion. Also, state that if SVE alone does not meet the RG, then thermal will be implemented.</p>	<p>The criteria to be used to determine whether SVE will be applied to a given depth or volume where TCE is greater than the RG of 1 mg/kg is provided below. These criteria will be evaluated using the data collected from the PDI soil boring program and the SVE pilot test as described in Section 3 of the RDWP and Section 4 of the Pilot Test Work Plan contained in Appendix D of the revised Draft RDWP, respectively. The text in Section 3 of the revised Draft RDWP and Section 7 of the Pilot Test Work Plan have been revised to include the below criteria for determining whether SVE alone will meet the OU3 RG.</p> <ul style="list-style-type: none"> For SVE to be effective in the transmission of air through the subsurface unsaturated soil an intrinsic permeability of at least 10^{-13} square centimeters (cm^2) or greater is recommended. The intrinsic permeability is a measure of the ease with which a porous medium can transmit air, water, or other fluids; <p>The corresponding calculated air permeability of the unsaturated soil shall be greater than 10^{-10} cm^2 for the soil to be amenable to SVE as provided in the <i>Engineer Manual on Soil Vapor Extraction and Bioventing</i> (USACE, 2002). Air permeability is the ability of vapors to flow through the soil and is the most important parameter with respect to the design and success of SVE systems in meeting the RG;</p> <ul style="list-style-type: none"> Evidence of soil gas composition (CO_2, O_2, CH_4, and VOC) changes within the vadose zone to confirm pore volume exchange during SVE testing. A statistically significant change or trend in soil gas composition during the test will be considered evidence of vapor flow; and 	<p>Recommend that P/TSE also discuss relative amount of TCE present in lower permeability zones where mass removal is diffusion limited vs. higher permeability zones where mass removal rates are largely tied to air flow. This may be the intent of the second to last bullet in Section 3.4.4 that describes selection of minimum pore gas velocity that takes into account rate limitations between mobile and immobile pores spaces; however, please confirm.</p> <p>Note to EPA:</p> <p>It is very likely the first three bullets will be met (and possibly the fourth). If mass is present in zones where air does not readily flow, then pore velocity does not drive the rate of cleanup.</p>
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	<ul style="list-style-type: none"> Achieve a minimum pore-gas velocity between 0.01 and 0.001 cm/s (or ~ 3 to 30 ft/day) everywhere within the contaminated zone where TCE > 1 mg/kg without requiring unacceptably close SVE well spacing per the following guidance documents: <i>Engineer Manual on Soil Vapor Extraction and Bioventing</i> (USACE, 2002) and <i>Development of Recommendations and Methods to Support Assessment of Soil Venting Performance and Closure</i> (USEPA, 2001). <p>If the above criteria are not met resulting in the conclusion that SVE alone will not meet the RG, then in-situ thermal remediation (ISTR) will be implemented.</p>	
2. Section 3.0, Pre-Design Investigation Activities, last paragraph – Add language that, “The results of the PDI will be evaluated and presented in the Preliminary (30%) Design Report, or sooner, if appropriate...”.	The following text has been added to Section 3 of the revised Draft RDWP: <i>“The results of the PDI will be evaluated and presented in the Preliminary (30%) Remedial Design Report and draft Pilot/Treatability Study Evaluation (P/TSE) Report in accordance with the Section VI.C.4 of the OU3 SOW.”</i>	Concur. Note to EPA: Text added as indicated.
3. Section 3.0, Pre-Design Investigation Activities – Please indicate whether there is flexibility to install angled borings along other sides of the 20,000 sq ft (e.g., northern and eastern) if additional delineation is needed.	The following text has been added to Section 3.2 of the revised Draft RDWP regarding the flexibility to install angled borings at other areas within the former ANC building: <i>“If data gaps remain in areas where access is limited in the TCE impacted soil area where vertical borings are planned, additional angled borings will be considered to complete the delineation of TCE impacts > 1 mg/kg at these locations to the extent practicable (e.g., based on existing building constraints and health and safety considerations).”</i>	Concur. Note to EPA: Text added as indicated. 2 additional PDI angled borings were added to Figure 11 (SB-21 and SB-22) along south side of Source Area A.

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<p>4. Section 3.2, Pre-Design Soil Sampling and Analysis Plan, second paragraph - The onsite mobile lab will allow adaptive sampling in the field. Specify how field changes to PDI boring locations will be communicated to EPA.</p>	<p>The following text has been added to Section 3.2 of the revised Draft RDWP specifying how field changes to PDI boring locations will be communicated to USEPA: <i>"The procedures for communicating field changes to PDI boring locations to USEPA is summarized below:</i></p> <ul style="list-style-type: none"> <i>Proposed field changes to PDI boring locations will be submitted in writing (email is acceptable) by Ramboll Environ (Project Engineer, PDI Field Manager or PPPI's designated representative), which has the authority and responsibility set forth to initiate field changes with PPPI for approval.</i> <i>Ramboll Environ will discuss the requested PDI boring location field change with USACE and representatives of Albéa (Plant Engineer and EHS Supervisor) to seek concurrence on the field change and to provide additional information that may be requested to make a determination.</i> <i>Concurrence by the USACE/USEPA on the field change may be accomplished via e-mail to the Ramboll Environ Project Engineer, PDI Field Manager or PPPI designated representative.</i> <i>If approved, the Project Engineer, PDI Manager or PPPI's designated representative will instruct the drilling contractor to proceed with the proposed field change.</i> 	<p>Concur.</p> <p>Note to EPA: Text added as indicated.</p>
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<p>5. Section 3.2, Pre-Design Soil Sampling and Analysis Plan, third paragraph, first sentence - Please note that EPA understands that Ramboll Environ is capitalizing on drilling operations inside the Albea facility, by using the soil borings for the installation of the monitoring points (thermocouples, vapor monitoring points and heat resistant monitoring wells) for the SVE pilot testing activities and for implementation of ISTR. However, EPA will not approve of the sufficiency of the ISTR infrastructure until Remedial Design. Thus, Ramboll Environ proceeds at their own risk.</p>	<p>On behalf of PPPI, the Agency's comment is acknowledged.</p>	<p>Concur.</p>
<p>6. Section 3.2.2 – Soil Sampling Methods and Table 1 – In the second paragraph it states, "Based on recovery, a minimum of two soil samples will be collected from each five-foot core run." Please specify/clarify depths that sampling will begin and end.</p> <p>Section 3.2 states borings will be installed to approximately 100 ft bgs. Table 1 lists sampling depths from 40-120 ft for 7 of the borings and 2 to 120 ft for the remaining 13. If Table 1 is correct, please provide rationale for beginning sampling at 40-ft bgs at 5 of the 20 borings.</p> <p>At least 4 of the historical soil borings have TCE results > 1 mg/kg at 100 ft bgs with no sample collected below 100 ft bgs. (e.g., BS14: 5 mg/kg, BS17: 2.8 mg/kg, SBI-05: 2 mg/kg, and SBI-08: 2.5 mg/kg). Based on these results, continue to collect sample below 100 ft bgs to define the vertical extent of TCE > 1 mg/kg in the vadose zone (120-129 ft bgs according to MW12).</p>	<p>Sampling will begin once native soils beneath the building slab or foundation backfill are encountered except for those locations noted in Table 1 where the sampling depth will be initiated at 40 feet bgs. Soil sampling will be initiated at 40 feet bgs at seven proposed PDI soil boring locations where delineation data gaps exist in the lower portion of the vadose zone at those respective locations. Once initiated, sampling will continue through the unconsolidated zone at all locations until the top of competent rock is encountered.</p> <p>The top of weathered bedrock within the molding area varies from 85 to 106 feet bgs at all deep existing soil boring locations with the possible exception of the POHMW-12 location. Accordingly, Table 1 of the revised Draft RDWP has been revised to adjust the bottom of the projected sampling interval from 120 feet to the top of competent bedrock.</p>	<p>Concur.</p> <p>Note to EPA: With the exception of PDI-SB-04, the 0-40 ft interval has been previously characterized at the other 6 PDI borings where initial sampling starts at 40 ft bgs. PDI borings SB10 and SB16 are near previous borings (SBI-01 and SBI-03) where data was rejected/not available but PID readings indicate low levels of mass. Also, two new horizontal borings were added to south side.</p>

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<p>7. Section 3.5, POHMW12 Replacement – Provide full well construction details (depth, diameter, annulus material) in RDWP or reference where these can be found. Collect a baseline sample from the replacement well as part of the PDI given that MW12 “is a well that will be used to evaluate the performance of the OU3 remedy”.</p> <p>POHMW12 is located in the middle of vadose contamination yet historical results show relatively low concentration in GW (~100 ug/L TCE), directly beneath Area A. Clarify what measures will be taken to ensure vadose zone mass is not inadvertently carried into the carbonate bedrock where the monitoring well is completed.</p>	<p>Monitoring well POHMW12 was installed in a 6- inch diameter rotosonic drilled borehole to a depth of 138 feet bgs. The well was completed using a 2-inch Schedule 40 PVC with a 15-foot long, 10-slot screen from 120 to 135 feet bgs, No. 1 Sand Pack from 118 to 135 feet bgs. No. 00 Sugar Sand from 115 to 118 feet bgs, and a cement/bentonite grout from 0 to 115 feet bgs. The soil boring / well construction log for POHMW12 has been included as Appendix F to the RDWP. Please note that monitoring well POHMW12 has been sampled repeatedly in the quarterly Performance Monitoring and OM&M activities for the Groundwater Extraction and Treatment System (GWETS) for OU1 (TCE) that has been ongoing since March 2016.</p> <p>The POHMW12R replacement monitoring well will be installed by first abandoning POHMW12 in place by filling the bottom 20 feet of the well with bentonite pellets, hydrating the pellets with water for 60 minutes, and grouting the balance of the well with bentonite grout. The POHMW12R replacement well borehole would be overdrilled through the existing POHMW12 well using 9 by 8-inch sonic tooling to a depth of 138 feet bgs. A two-inch stainless steel well would then be completed within the overdrilled borehole following the same well construction design as the original POHMW12 monitoring well.</p> <p>Once POHMW12R replacement monitoring well has been installed and developed, a baseline groundwater sample will be collected from the well prior to the initiation of soil remediation.</p> <p>This manner of well conversion from POHMW12 to POHMW12R would minimize further conveyance of contaminants deeper into the carbonate bedrock.</p>	<p>Concur.</p> <p>Note to EPA: Well construction information provided as indicated and USACE concurs with installation method.</p>
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<p>8. Section 3.5, POHMW12 Replacement - Replacement of POHMW12 provides an opportunity to obtain a better vertical profile in this area. While observations of the cores and field screening will provide a qualitative assessment of mass present within the planned screen interval, EPA recommends grabbing groundwater samples from the top of the water table to at least two depths below the planned screened interval to obtain a better vertical profile in this area.</p>	<p>Ramboll Environ respectfully disagrees with USEPA's recommendation to drill a deeper borehole within the saturated zone and through the source area soils of the firmer Molding Room. A deeper borehole within the source area has the potential to provide new pathways (fracture conduits) for TCE contamination from the source area to deeper portions of the fractured bedrock aquifer. The concern regarding the promotion of downward migration of contamination deeper within the formation during drilling is also expressed by the Agency in the Specific Comment 7. (Section 3.5, POHMW12 Replacement), above. The minimal additional information that might be gained by a deeper bedrock borehole installed through the source area soils simply does not outweigh the significant risks posed by creating new contaminant conduits to the fractured bedrock aquifer.</p> <p>A less risker approach to obtain information on the depth of groundwater contamination for OU3 is proposed by means of installation of additional downgradient groundwater monitoring wells located outside the Albéa building. The locations of two new proposed monitoring wells (No.'s POHMW48 and POHMW49)) are illustrated on Figure 13. The proposed field methods for installation and testing of the two new bedrock monitoring wells is provided in Section 3.5.2 of the RDWP. In addition to the converted well POHMW12R and existing wells POHMW13 and POHMW15, these two new wells are proposed to provide a means of long term groundwater monitoring during and following treatment of the OU3 soils. The borings for the two new wells are proposed to be drilled using roto-sonic methods and with vertical profile sampling (i.e., packer testing) to provide information on the depth of TCE impacts to groundwater within the bedrock. Following review of the packer test results, concurrence on the manner of well construction (i.e., well depth and screened interval) will be sought from the USEPA.</p>	<p>Note to EPA: In EPA comment 7, Ramboll-Environ indicates how they plan to ensure that vadose zone mass is not inadvertently carried in to the carbonate bedrock when drilling the new well POHMW12R. In EPA comment 8 Ramboll-Environ indicates it "has the potential to provide new pathways" to drill deeper for vertical profiling at the same location. If they have already drilled through the vadose zone as described in the response to EPA comment 7, it does not make any difference if they drill deeper at the same locations. The two responses seem to contradict each other. <i>If EPA agrees to installing MW48 and MW49 vs. vertical profiling at POHMW12R then POHMW48 should be moved to the west inside the 500 ug/L isoconcentration contour for groundwater.</i></p>
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Section 4. Remedial Design Approach and Work Elements		
1. Work Plan Section 4.2.3 - Please clarify if any of the soil borings will be sent to an off-site laboratory for confirmatory analysis.	Because the proposed mobile laboratory (Cascade Mobilab) is NELAP-accredited and provides defensible data that have undergone Level 4 data validation, no confirmatory analysis will be performed by an off-site laboratory. The revised Draft QAPP (Revision 9) submitted concurrently with this RDWP includes information on the analytical methods, lists of analytes, holding times, the Mobilab Quality Assurance Plan and the mobile laboratory SOPs.	EPA comment
2. Section 4.4.6, Performance Verification Monitoring - Performance Verification Monitoring describes a multiple lines of evidence approach to confirming the remedial goal for TCE has been achieved. Specify if this approach is proposed for thermal only (i.e., relying on temperatures goals and mass removal curves based on vapor and condensate) or, if it is also being suggested for SVE. If SVE alone is implemented, soil confirmation samples will be required by USEPA to support achievement of the remedial goal.	The multiple-lines-of evidence approach described in Section 4.4.6 of the Draft RDWP is proposed for ISTR, deep SVE, or a combination of these two technologies to determine when the RG of 1 mg/kg TCE might be achieved and to assess if a confirmation soil sampling program should be initiated. This multiple-lines-of evidence approach is consistent with guidance such as <i>Engineer Manual on Soil Vapor Extraction and Bioventing</i> (USACE, 2002) and <i>Development of Recommendations and Methods to Support Assessment of Soil Venting Performance and Closure</i> (USEPA, 2001) for SVE and <i>Engineer Manual on In Situ Thermal Remediation</i> (USACE, 2014) for ISTR. These lines of evidence will be described in the draft Preliminary (30%) Design Report for the remedial technology that is proposed following evaluation of the PDI results.	Note to EPA: Suggest EPA retains confirmation soil sampling as option in SVE only remedy. The multiple lines of evidence approach in Section 9-5 of <i>Engineer Manual on Soil Vapor Extraction and Bioventing</i> (USACE, 2002) includes soil sampling as method of verification.
Figures		
Figure 4 – Geologic Cross-Section		

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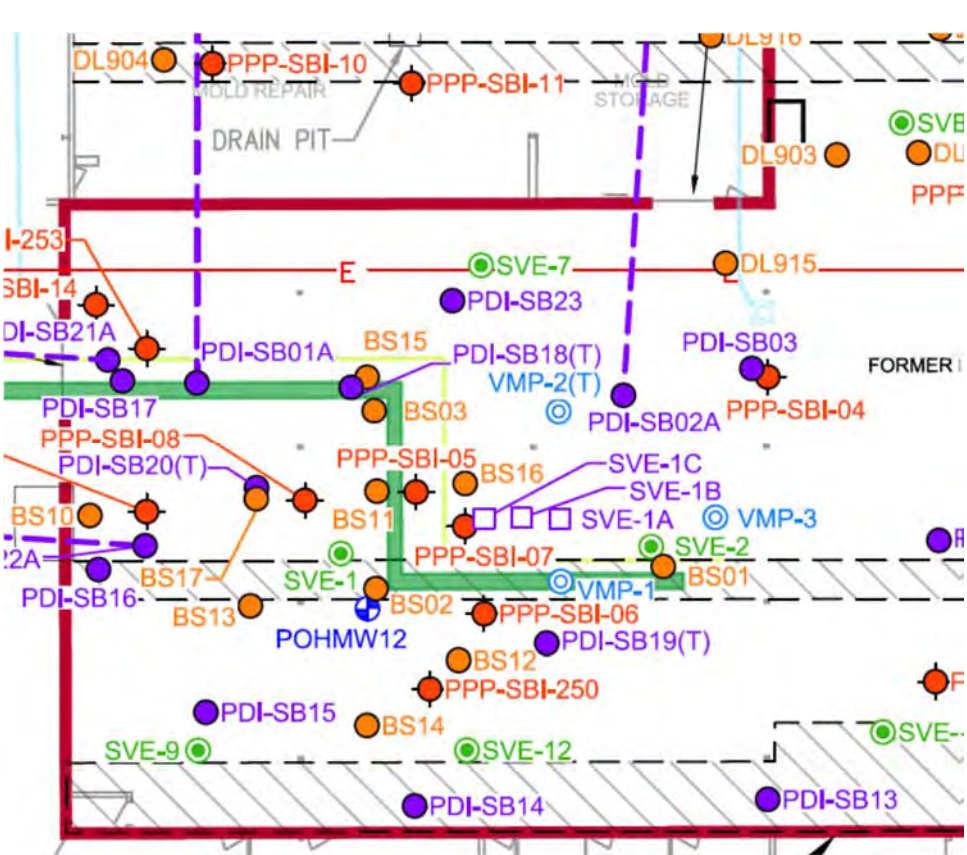
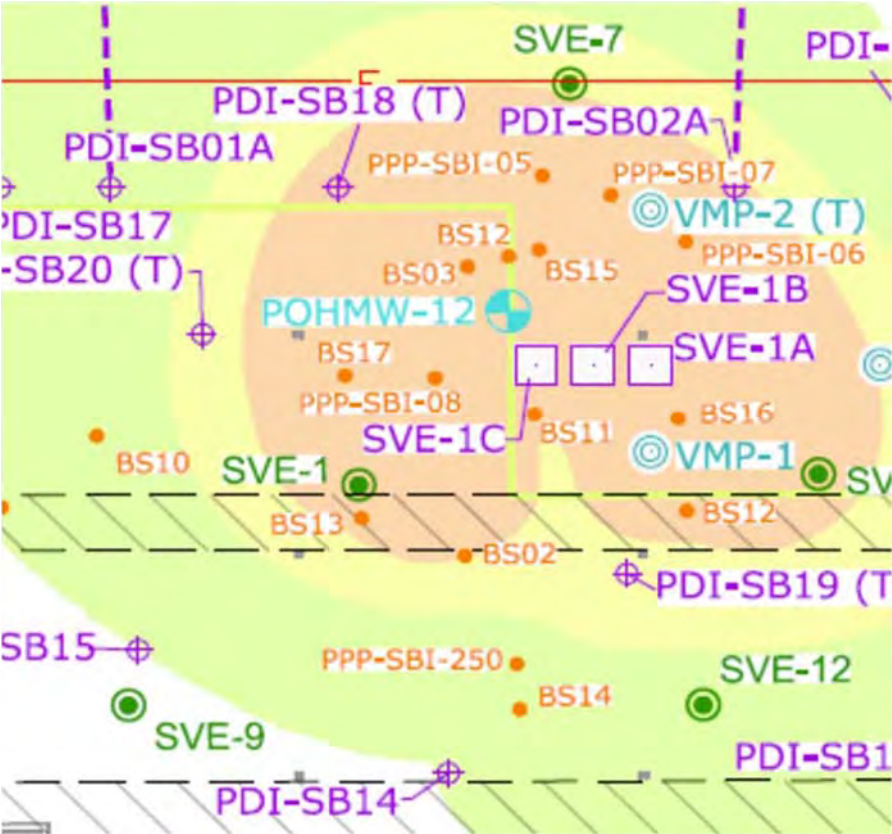
<p>1. The RI cross section included as Figure 4 in the RDWP presents very little lithologic information specific to Area A overburden. Please provide a more focused cross section specific to Area A to support the RD. Evaluate and discuss whether the downward coarsening of the silt toward the bedrock interface (mentioned in Section 2.3.2) is supported by the logs and explains contaminant distribution.</p>	<p>The Geologic Cross-Section figure was updated to provide three geologic cross-sections through Area A. The focused cross-sections are illustrated as Figures 5A and 5B in the RDWP. The drilling and boring logs from which these cross-sections were constructed were performed by multiple drill crews and logged by multiple geologists.</p> <p>Unconsolidated vadose zone grain size information is solely derived by the USCS boring log descriptions provided by the various geologists. There is an overall upward fining grain-size trend within the vadose zone. Indirect empirical evidence of an inferred fining upward grain-size trend within the vadose zone is supported by the existing TCE contaminant distribution data.</p>	<p>Concur.</p>
<p><i>Figures 5–10 – Extent of TCE in Soils at varying depths</i></p>		
<p>1. Figures 5 – 10 - There appears to be discrepancies between the 2006 BS boring locations presented on Figures 5 through 10 of the RDWP and the 2007 PPPI RI Report, Plate 5.</p> <p>For example, was BS11, the location with the single highest soil concentration, west of MW12 (Plate 5) or east of MW-12 (RDWP)? Where is the sanitary sewer drain line in relation to these borings? Why are there two BS12's shown in RDWP?</p> <p>A screen shot of the two figures has been included at the end of the comments.</p>	<p>The observed discrepancies in the past soil boring locations have been reviewed, and corrected boring locations are presented in the figures of the revised Draft RDWP.</p>	<p>Concur.</p> <p>Were these changes responsible for the adjusted contaminant distribution depicted in Figures or were other modeling assumptions (e.g., kriging confidence intervals) also adjusted?</p>
<p>2. Figure 5 - Does the green shading (1 mg/kg to 10 mg/kg) near DL902 incorporate the DL902 detection of 180 mg/kg TCE at 2 ft bgs?</p>	<p>The TCE impact in this area has been incorporated in the EVS model to account for the detection of TCE at the DL902 soil boring location and is shown in Figure 6 of the revised Draft RDWP.</p>	<p>Concur.</p>
<p>Tables</p>		
<p><i>Table 1: Pre-design Investigation Soil Boring Information</i></p>		

Pohatcong OU3 Draft RDWP Comment Matrix

<p>1. Completion of PDI soil borings as thermocouples: temperature sensors are specified every 20-ft (Table 1 of RDWP). Clarify whether additional temp sensors (e.g., vertically every 5-ft vs. current spacing of 20-ft) will be deployed at each location in the event thermal is implemented. Please include a well completion diagram for these points, similar to the SVE and VMP well construction diagrams in Appendix D.</p>	<p>The selection of thermocouple spacing will be based on the PDI results, and will depend on the final thermal treatment zone depth and lateral extent. The general rule-of-thumb for locating thermocouples will be as follows:</p> <ul style="list-style-type: none"> • Above the thermal treatment zone, a vertical spacing of 10 ft between thermocouples will be utilized. • Within the thermal treatment zone, a 5 ft vertical spacing will be used at each thermocouple location. • If the thermal treatment zone starts deeper than 15 ft, the first sensor will be set at 5 ft below grade. <p>The placement of thermocouples at each temperature monitoring location will be customized based on the vertical and lateral extent of treatment and may also incorporate additional sensors at select depths based on site conditions (certain soil layers, interface between strata, etc.). Table 1 of the revised Draft RDWP has been revised to reflect the above recommended vertical spacing. Because the placement of the thermocouples at each temperature monitoring location is likely to vary, a completion diagram for these points is not provided in the revised Draft RDWP. A diagram of the final placement and vertical thermocouple spacing at each temperature monitoring point is proposed to be provided in the draft Preliminary (30%) Design Report.</p>	<p>Concur.</p>
<p>Appendices</p>		
<p><i>Appendix D:</i></p>		

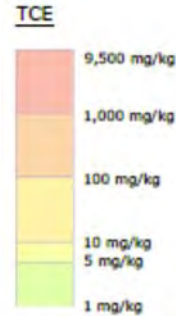
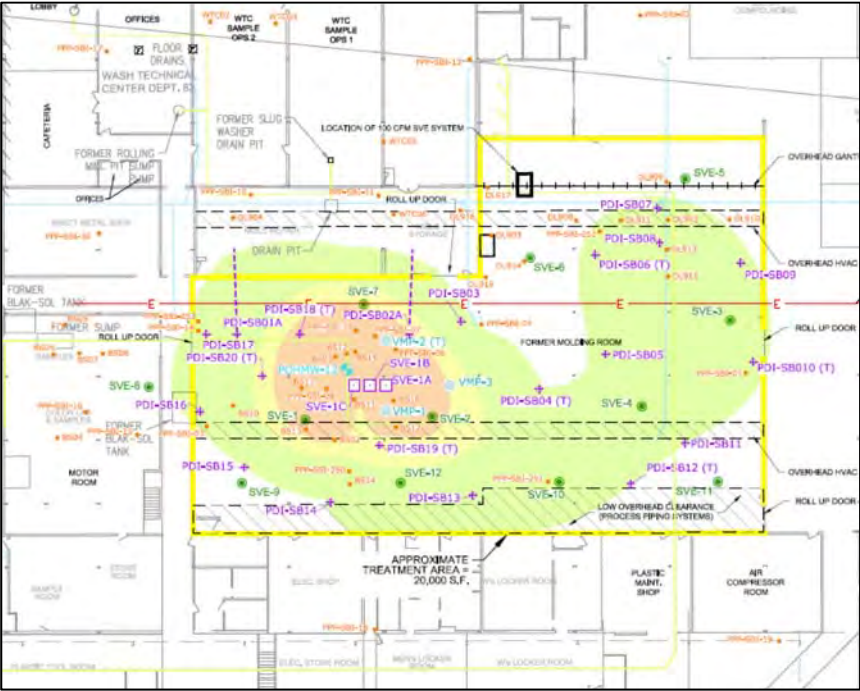
Pohatcong OU3 Draft RDWP Comment Matrix

<p>1. Section 3.1.1 - "A minimum 2.5-foot bentonite chip seal will be placed within the annular space above the top of the sand pack and hydrated." Provide clarification as to how the bentonite chip seal will be hydrated. Also, "The grout will be installed from the top of the bentonite seal upwards using a tremie pipe". Please consider use of a side discharge tremie.</p>	<p>Section 3.1.1. of Appendix D has been updated in the revised Draft RDWP as follows. <i>"Upon placement of the 2.5-foot bentonite chip seal, water will be added on top of the seal layer and will be allowed to hydrate for a period of 60 minutes before grouting the balance of the borehole using a side discharge tremie pipe."</i></p>	<p>Concur.</p>
<p>2. SVE Pilot Test - Is there a reason an 11.7 eV lamp will be used for SVE pilot test rather than 10.6 eV lamp which is listed in RDWP? The ionization energy for TCE is 9.47 eV. Is the SVE pilot study tracking other significant VOCs with IE>10.6? Use 10.6, unless 11.7 is really needed.</p>	<p>The draft SVE Pilot Test Work Plan has been revised to include the use of a 10.6 eV lamp.</p>	<p>Concur.</p>
<p><i>Reference for Figures 5-10 Comment #1:</i></p>		



Pohatcong OU3 Draft RDWP Comment Matrix

Draft RDWP (6,800 cy >1 mg/kg TCE)



Draft Final RDWP (13,110 cy >1 mg/kg TCE)

